# Owner's Manual

## Professional Digital Amplifier

**ΣM SERIES**

This manual does not include relevant equipment design, production and all detail changes, as well do not cover the installation, operation or all the situations that may arise during the maintenance

The information provided in this manual is accurate when be sent out from the factory, but now this manual may has been updated because of the product changes. If you want to get the latest version or the English version of this manual, please contact 0086-0757-87322796 or visit our website www.appaudio.cn

# IMPORTANT SAFETY INSTRUCTIONS

- Only can plug the unit to the AC outlet which is instruct in the user manual or the specifications shown on the adapter. Otherwise it may cause fire or electric shock.
- Do not allow water to enter the unit or to make it damp. Otherwise it may cause fire or electric shock.
- Do not place a container with liquid or small metal objects on the unit. Otherwise,liqu -id or small metal objects will fall inside the unit that may cause fire or electric shock.
- Do not place heavy objects (including this unit) on the power cord, especially which is covered by the carpet. Otherwise it may damage the power cord, which will lead to a fire or electric shock.
- Avoid using the unit in the following places:
  — Expose it under the splashing oil foam and steam, such as near cooking stoves, humidifiers and other places.
  — At the unstable surface, such as the shaking desktop or slope.
  — Expose it under the hot environments, such as the car with all the windows be closed or subject to direct sunlight.
  — Expose it under the high humidity environments or the places with dust accumulation.
- Do not place the power cable near the heaters. Otherwise it may lead to melt, then causing a fire.
- Hold the insulation of the plug when unplug the power cord from the AC outlet. Do not pull the cable directly. Otherwise it may damage the cord, which leads to a fire or electric shock.
- Do not touch the power plug with wet hands. Otherwise it may cause electric shock.
- This unit has a front and rear ventilation holes to avoid affecting the inside device cooling, do not block them. Otherwise it may cause a fire.
  Specially attention:
  — Do not place the unit on its side or upside down.
  — Do not place the unit in poorly ventilated places, such as a bookcase or closet.
  — Do not use tablecloths to cover the unit, or put it on the carpet and the bed.
- Leave enough space around the unit, in order to facilitate proper ventilation.
  The space should be:
  At least 10 cm for both sides, at least 10 cm for above.
  If it can not keep enough air flow, the unit's internal temperature will rise that may cause a fire.
- To relocate the unit, please unplug the power from the AC plug and unplug all connect -ed cables. Otherwise it may damage the cables then lead to a fire or electric shock.
- As the accessories of the unit (such as machine feet, manual bag, desiccant, etc.), please put it on the place which the children can not catch easily.
- Do not scratch, bend, twist, stretch, or heat the power cord. Otherwise it may damage the power cord, and then will lead to a fire or electric shock.

# IMPORTANT SAFETY INSTRUCTIONS

- Do not open the unit's casing. Otherwise it may cause electric shock. If you think the unit needs to be checked, maintained or repaired, please contact the dealer.
- Do not modify this unit. Otherwise it may cause fire or electric shock
- If there is lightning, please turn off the unit as soon as possible, and unplug the power cable from the power outlet.
- When connect the speakers to the amplifier's output jacks, only can use dedicated speaker cable. Using other cables may cause fire.
- When connect the unit, please turn off all the musical instruments, audio equipments and speakers. Please use the correct cable, and connect it in accordance with regulations.
- Before turning on the power supply of this unit, please be sure to spin the volume control to minimum. Otherwise, a sudden burst of sound may damage your hearing.
- If you do not use the unit for a long period of time, please unplug the plug from the AC outlet. Otherwise it may cause fire.
- If the power cord is damaged (such as cut or bare wire), please ask for a replacement from the dealer. Otherwise, continue to use this unit that may cause fire or electric shock.
- If this unit falls down from a height or the cover is damaged, please immediately turn off the unit and unplug the plug from the AC outlet, otherwise it may cause fire or electric shock. At the same time please contact the dealer.
- When finding any abnormality, such as smoke, odor, noise or foreign matter and other liquid enter into the unit, please immediately turn off the power switch and unplug the power cord from the AC outlet. Otherwise, continue to use that may cause fire or electric shock. Please contact dealer for repair at the same time.

**For your safety and the unit to work properly, please strictly follow the manual's instructions for installation and operation!**

# 1.WELCOME

Thank you for your purchase and use!
The cabinet of the ΣM Series is designed with the international 1U standard, as well as small size and powerful. In order to ensure the user to use the product stably and effectively, please carefully read this manual and follow the guidance manual to install and operate this unit carefully.

## 1.1.Basic functions descriptions

- Universal PFC (Power Factor Correction) power supply, which can be used all over the world.
- This product is implementing a three-year warranty commitment to protect your investment interests.
- The front panel has a large number of LEDs to provide you accurate working status information of the product.
- Adopt the modular circuit design to facilitate cooling and maintenance.
- Adopt the smart variable speed fan to force the air cooling.
- Efficient circuit protection design can avoid output short circuit, DC, load, over-temperature, over / under-voltage, high frequency overload protection and so on.

## 1.2.How to use this manual

This manual provides you the information of the safe and proper setting and operation for this unit. But it does not cover the use instructions of every occasion and all the situations that may arise. For more information, please visit: http://www.appaudio.cn or contact our technical support, system installer or dealer.

Strongly recommend that you read this manual including all the instructions, warnings and precautions. In addition, in order to protect your interests, please keep sales slip or invoice well, which is your credentials of purchasing our products.

## 1.3.Symbol Description

The exclamation mark within the triangle symbol is used to prompt the user to pay attention to the important operating or special instructions.

The lightning symbol within the triangle symbol is used to prompt the user pay attention to the risk of electric shock

## 1.4.Service Information Card

Attach a "maintenance information card" at the end of this manual, if the unit is fault and send back to the dealer or service center for repair, please fill out the form and deliver with the unit.

# 2.INSTALLATION

**Warning: Before you beginning to install the unit, please make sure to carefully read and follow the "important safety instructions" at the beginning of the manual.**

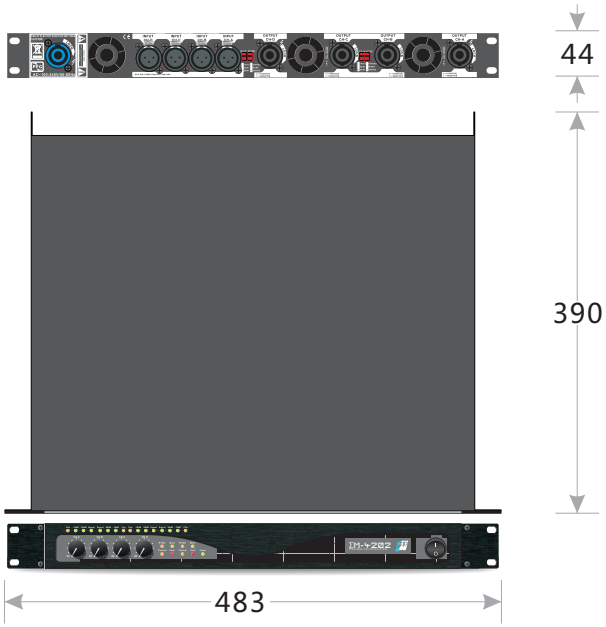
Open the packaging and check whether the unit is damage or not during the transportation. If the unit is found damaged, please immediately notify the transportation company. Only you have the right to ask for the transport damages compensation. Please keep the box well as the damage evidence and provide it for the side delivery checking. Our company will provide you with necessary assistance.

In addition, we also recommend you saving all packaging materials for the need of the transportation. Do not transport the unit without package to avoid damaging the unit.
To make the unit work normally, you also need to prepare the following parts (our company does not provide):

1. Input wiring cable;Output wiring cable;
2. Ethernet cables (individual series need to use the advanced features);
3. Network router (individual series need to use the advanced features);
4. Rack or unit mounting bracket (provide a stable table for the unit stacked).

**Warning: The third pin (grounding) of the AC power cord connector which this unit uses is the necessary security components. Do not use adapters or other methods to make the ground connection failure.**

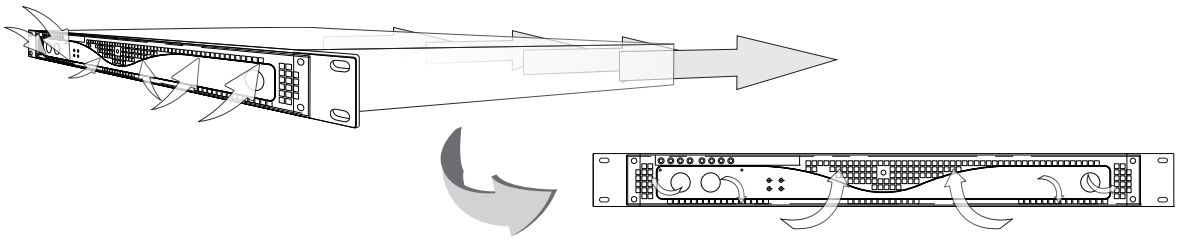
## 2.1.Structure diagram




*The renderings are only for reference, and the actual item is the standard.

## 2.2.Cooling Description

This digital amplifier series is designed according to international 1 U size standards. The cooling method is: pumping the outside air into inside the unit through the vents of the front panel, and then bring out the heat through the aluminum radiator in the unit and then out from the rear panel vents. The "smart" variable speed DC fan is equipped in the unit, and then it can adjust the wind speed through the temperature detection and circuit detection for the heat sink module. When the unit inside overheats, it will adjust the fan speed to increase cooling efficiency immediately.
If any heat-sink overheats, the detection circuit will reduce output power. If the amplifier overheats, the temperature protection detection circuit and its circuit will shut down and power off until it cools to a safe temperature.
After using this unit for a period of time (not referring to the turn- on time), if it can not meet the cooling effect after the fan running with high speed for a long time, please turn off the machine and remove the mesh enclosure to clean up the dust (only for the unit with the mesh enclosure design).
The air flow diagram of the unit cooling is shown as below, please ensure that there is enough space for the fixed installation of the unit.



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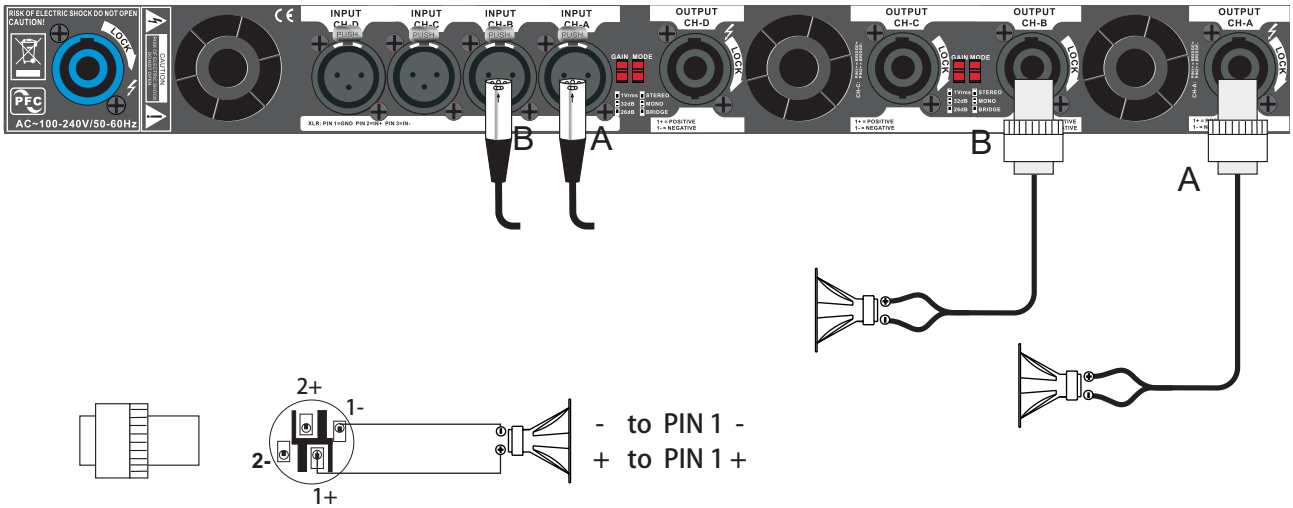
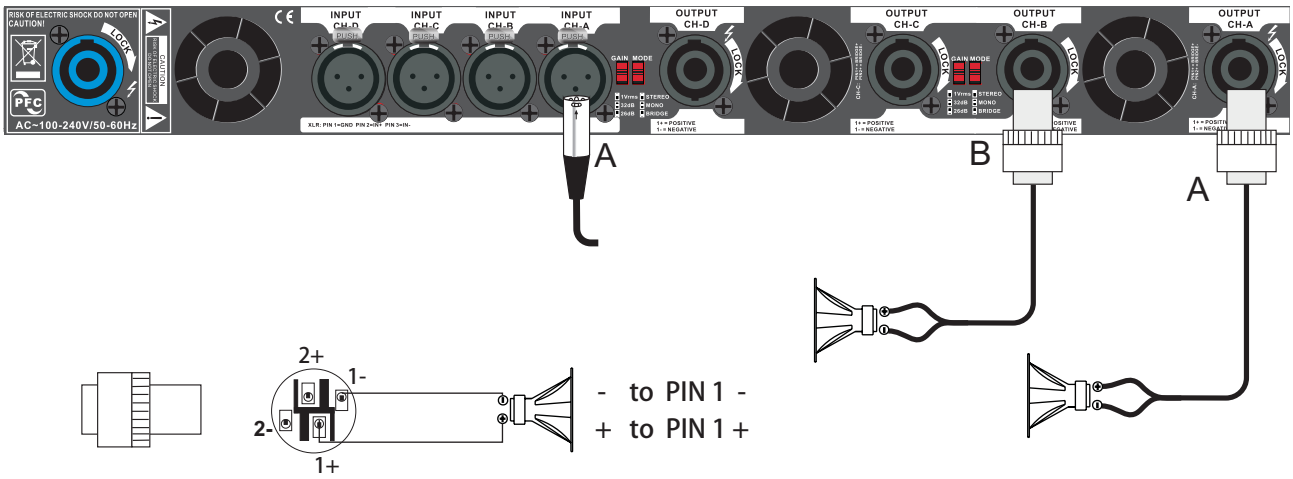
## 2.3.Connection mode illustration

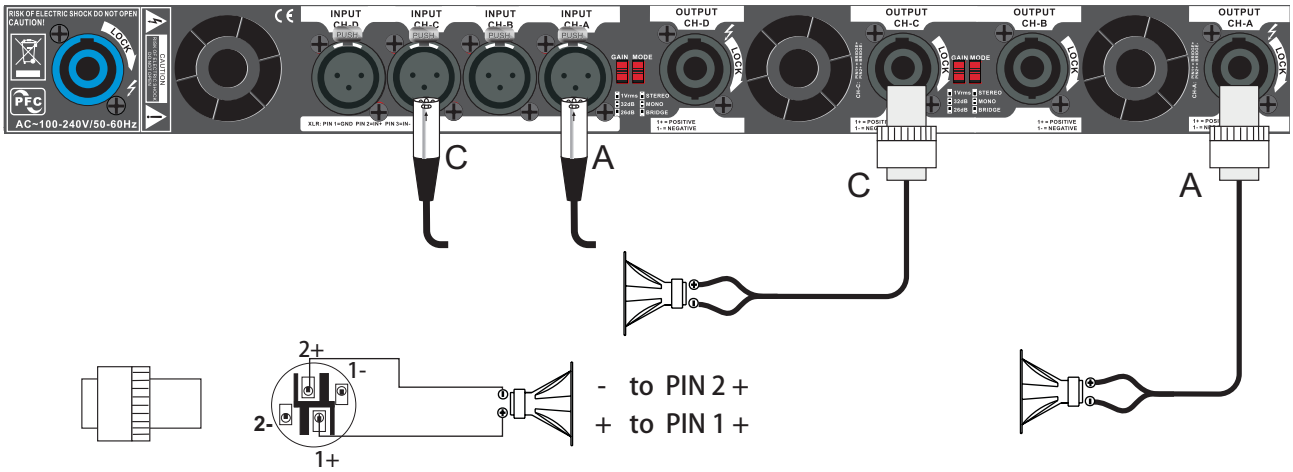
### 2.3.1.Stereo mode connection illustration



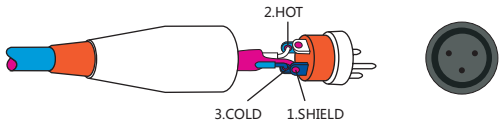
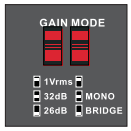
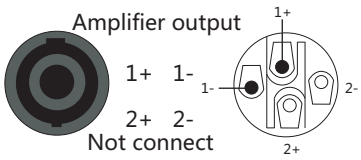
## 2.3.2.Mono mode connection illustration




## 2.3.3.Bridge mode connection illustration




## 2.3.4.Interface illustration

| XLR (male) plug typical pin assignment | Gain/Mode | Output connection |
|---|---|---|
|  |  |  |

# 3.OPERATION

**Warning: Before turning on the unit, please make sure the unit is power off, the power switch is in the "OFF / off" position, and all the volume knob has been set to the lowest position.**

## 3.1Speaker protection

Clipping not only make the sound worse, but also will damage the high frequency drive unit. It is recommended you that don't do the clipping to the unit's signal to protect the speaker. In addition, to avoid the speaker drive circuit burned which is caused by the strong infrasound signal transmission of the unit, breathing or the high level which is caused by the dropping of the microphone and the low frequency signals. It should take one of the following ways:

1. Install the high-pass filter between the mixer output and unit input.
2. Use the built-in DSP to set the high-pass filter (only for the unit with DSP).
3. Install a high-pass filter at the sides of the mixer. At the premise of without affecting the use, set the filter frequency as high as possible. For example, for music is set to 35Hz, for the microphone is set to 75Hz. In each mixer's input channel, set the frequency of the filter with the relevant channel below the lowest fundamental frequency.

**Warning: Do not put the sensitive high-gain devices (such as tape deck) above or below the unit directly. This will form a strong magnetic field to cause a "buzzing" sound near the unshielded device. If you use a cabinet, we recommend you to place the sensitive devices at least 20cm to the units.**

## 3.2.Start-up procedure

According to the users' needs, please follow the connection illustration section of the stereo, bridge or mono mode of the manual to install, if it is necessary to change the mode, please disconnect the power supply.

### 3.2.1.Precautions

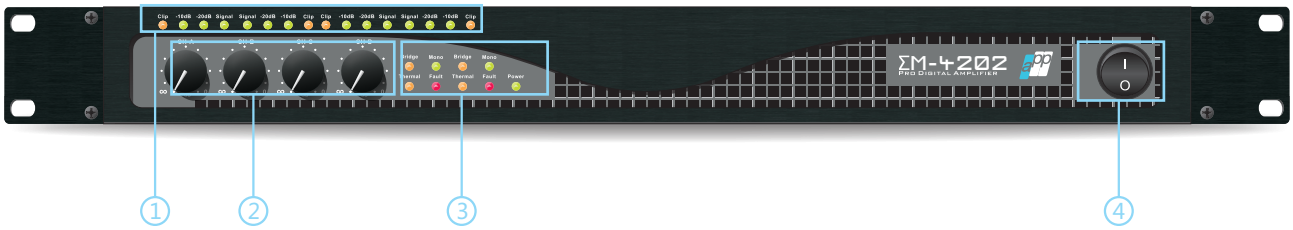
Although the unit is protected when happens the internal and external fault, but you should take the following measures to let the unit's operation to reach the optimum performance and the maximum safety:

1. Before using the unit, please configure the unit first to make it work normally. Include the connections of the input wiring and output wiring. The improper wiring connection will cause the serious operational difficulties. The relevant configuration of the unit, please refer to the "Installation" section of the manual.
2. Please be careful when connect, select the signal source and control the output level. This can save you a lot of troubles.

**Warning: Do not connect the output end to the power supply, the battery or the primary power. This may cause electrical shock.**
**Note: There is signal passing after turning on the unit, the output interface may exist the fatal voltage.**

3. Do not short connect the ground wire and the input signal ground wire of the cable. This will form a ground loop and cause the oscillations.
4. Tampering or modifying the circuit without authorization will be dangerous and will make all services provided by agents lose efficacy.
5. Do not use the unit when the yellow clip LED is continued flashing.
6. Do not make the mixer overload, otherwise it will send a clipping signal to the unit. The unit will accurately reproduce such signals, which may cause speaker damage.
7. Do not use the unit when the load impedance is lower than the nominal. Because of the output protection of the unit, this configuration will result to the premature clipping and speaker damage.

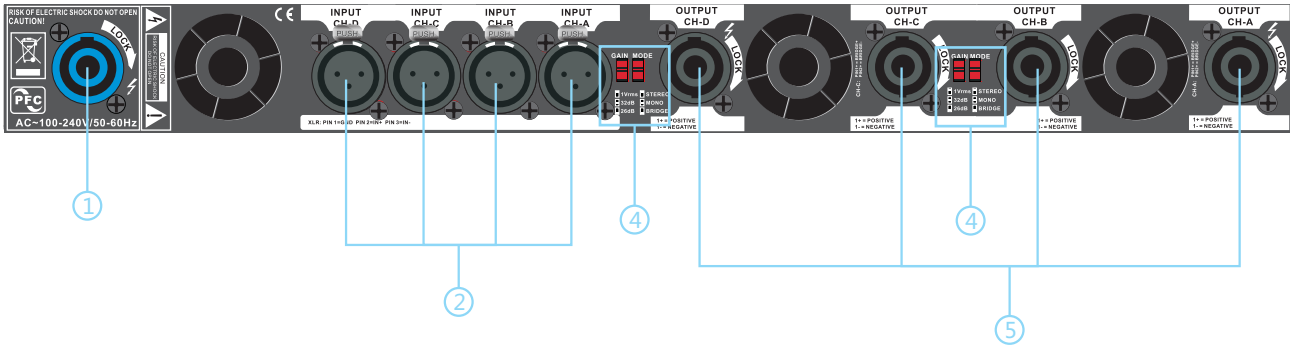
## 3.3.Operation Front Panel




| Item | Illustration | Functions | Description |
|---|---|---|---|
| 1 | | Clip LED | The LED lights up orange when the output signal distortion on the corresponding channel rises above 1% , which indicate that the "clipping" has occurred because the signal level is too high. |
| | | Signal LED | The corresponding LED will light up when the input signal exceeds -32dB, -20dB and 10dB. If the signal LED does not light up, please check the gain setting, the input connections, the signal audio source and whether the output line is short circuit. If the Signal 20dB or -10dB LED illuminates with no signal input, there may be system oscillations or some other malfunction. Disconnect the load and fully reduce the gain. If the LED remains on, shows that the amplifier needs servicing. |
| 2 | | Gain Control | The maximum voltage gain of the amplifier varies depending on the model is shown of the designation. The Gain controls are marked in dB of attenuation. There are 21 detents for repeatable adjustments. The upper 14 steps are about 1 dB each, and settings should not be used for normal program levels, as the input headroom could be exceeded, but can be used for testing at reduced levels. At the minimum setting, the signal is completely cut off. |
| 3 | | Power LED | Power on, LED will illuminate green. If no indication, please check whether the AC power cord or AC outlet is unusual or not. |
| | | Thermal LED | It will light up when the amplifier overheats |
| | | Bridge Mono | Bridge mode; Mono mode |
| | | Fault LED | It will light up red to indicate that protection is in effect. To provide protection, the unit will not output any sound from the speakers while this indicator is lit up. It will light up if the heat sink overheats, or if a DC voltage is detected at the amplifier outputs. Also it will light up for about a few seconds at time of power-on, as the amplifier gets ready to operate. |
| 4 | | Power Switch | Switch on and off the power supply. It will light up green when switch on. |

***The renderings are only for reference, and the actual item is the standard.**

## 3.4.Operation Rear Panel




| Item | Illustration | Functions | Description |
|---|---|---|---|
| 1 | | Power interface | Power cord: Standard power cord. Power outlet is the 16A polarized plug with ground which meets the GB 1002-1996 standard. |
| 2 | | Signal input | Input female XLR: The input plug uses the balanced female XLR plug. |
| | | | |
| 4 | | Gain Switch | When the gain switch is on 1Vrms, the input sensitivity of the amplifier is 1Vrms. When it is on 32dB, the amplification gain range is within 32dB. When it is on 26dB, the amplification gain range is within 26dB. |
| | | Mode Switch | STEREO Mode<br>Channel A and Channel B work independently. The input signal of the CHA outputs from the CHA output socket and the same as CHB.<br>MONO Mode<br>Channel A and channel B work independently. The output of the channel A is from the input signal A; the input of the channel B is from the input signal A.<br>BRIDGE Mode<br>Channel A and channel B work at the same time, and the output is from input signal A. |
| 5 | | Signal Output | Four core SPEAKON speaker socket: When the amplifier is in the Stereo mode, CHA\CHB will connect through this socket, the method is below: 1+, 1-. |

***The renderings are only for reference, and the actual item is the standard.**

# 4.Core parameter

| Model | ΣM-4150 | ΣM-4250 | ΣM-4350 | ΣM-4450 | ΣM-4550 |
|---|---|---|---|---|---|
| Rated Output Power 8ohm (THD=1%,1kHz) | 4x150w | 4x250w | 4x350w | 4x450w | 4x550w |
| Rated Output Power 4ohm (THD=1%,1kHz) | 4x270w | 4x450w | 4x630w | 4x800w | 4x950w |
| Rated Output Power 2ohm (THD=1%,1kHz) | 4x480w | 4x800w | 4x1100w | 4x1400w | 4x1600w |
| Maximum bridged output power 16ohm (THD=1%,1kHz) | 2x300w | 2x 500w | 2x 700w | 2x 900w | 2x1100w |
| Maximum bridged output power 8ohm (THD=1%,1kHz) | 2x540w | 2x 900w | 2x1260w | 2x1600w | 2x1900w |
| Maximum bridged output power 4ohm (THD=1%,1kHz) | 2x960w | 2x1600w | 2x2200w | 2x2800w | 2x3200w |
| Maximum RMS voltage swing (THD=1%,1kHz) | 34V | 44V | 52V | 60V | 66V |
| Slew rate (at 1kHz) | | | 50V/us | | |
| Input sensitivity(at rated output power or voltage,1kHz) | 1Vrms,32dB,26dB | | | | |
| THD 0.1W full power (typical value 0.02%) | ≤ 1% | | | | |
| IMD-SMPTE 0.1W full power (typical value 0.02%) | ≤ 1% | | | | |
| DIM30 0.1W full power (typical value 0.02%) | ≤ 1% | | | | |
| Crosstalk (ref.1kHz, at 10% rated output power 8Ω) | -70dB | | | | |
| Frequency response(ref.20-20kHz, 10% power, 8ohm load) | ±2dB | | | | |
| Input impedance | parallel20kΩ,unparalle10kΩ | | | | |
| Damping Factor (ref.100Hz,8ohm output load) | 200 | | | | |
| Signal to noise ratio (A weighted 20Hz-20kHz) | >105dB | | | | |
| Power Requirements | AC~100-240V(50-60Hz) | | | | |
| Protection | over heat/thermal output power control/long term output power control output short-circuit/overload protection/DC protection | | | | |
| Dimensions (W×D×H,mm) | 483x390x44 | | | | |
| Net weiht | 8.15Kg | | | | |

| Model | ΣM-4650 | ΣM-4102 | ΣM-4122 | ΣM-4152 | ΣM-4202 |
|---|---|---|---|---|---|
| Rated Output Power 8ohm (THD=1%,1kHz) | 4x650w | 4x1000w | 4x1200w | 4x1500w | 4x2000w |
| Rated Output Power 4ohm (THD=1%,1kHz) | 4x1100w | 4x1700w | 4x2100w | 4x2400w | 4x3000w |
| Rated Output Power 2ohm (THD=1%,1kHz) | 4x1700w | 4x2800w | 4x3500w | - - | - - |
| Maximum bridged output | 2x1400w | 2x2000w | 2x2400w | 2x3000w | 2x4000w |
| Maximum bridged output power 8ohm (THD=1%,1kHz) | 2x2200w | 2x3200w | 2x4200w | 2x4800w | 2x6000w |
| Maximum bridged output power 4ohm (THD=1%,1kHz) | 2x3400w | 2x5600w | 2x7000w | - - | - - |
| Maximum RMS voltage swing (THD=1%,1kHz) | 72V | 89V | 97V | 109V | 126V |
| Slew rate (at 1kHz) | | | 50V/us | | |
| Input sensitivity(at rated output power or voltage,1kHz) | 1Vrms,32dB,26dB | | | | |
| THD 0.1W full power (typical value 0.02%) | ≤ 1% | | | | |
| IMD-SMPTE 0.1W full power (typical value 0.02%) | ≤ 1% | | | | |
| DIM30 0.1W full power (typical value 0.02%) | ≤ 1% | | | | |
| Crosstalk (ref.1kHz, at 10% rated output power 8Ω) | -70dB | | | | |
| Frequency response(ref.20-20kHz, 10% power, 8ohm load) | ±2dB | | | | |
| Input impedance | parallel20kΩ,unparalle10kΩ | | | | |
| Damping Factor (ref.100Hz,8ohm output load) | 200 | | | | |
| Signal to noise ratio (A weighted 20Hz-20kHz) | >105dB | | | | |
| Power Requirements | AC~100-240V(50-60Hz) | | | | |
| Protection | over heat/thermal output power control/long term output power control output short-circuit/overload protection/DC protection | | | | |
| Dimensions (W×D×H,mm) | 483x390x44 | | | | |
| Net weiht | 8.15Kg | | | | |

# MAINTENANCE

This amplifier is a high-quality product, and the internal circuit is complex, please contact with our technical support to verify the maintenance needs first if it is fault. The circuit of this unit is very complex, only can be maintained by the professional technician which is trained fully.
When you send this amplifier to the manufacturer or authorized service center to repair, please fill out the "Mainten -ance Information Card" which is in the back of this manual This card must be with the product to pack in the carton, or pack it in the packing list envelope and firmly affix it to the outside of the shipping carton. Do not send this card alone. Our company does not undertake any responsibility for the one which is not within the maintenance range but has already been sent to the manufacturer.
Before sending the amplifier to repair, the product owner should be responsible for ensuring the unit whether is in maintenance range or not. About the detail maintenance range, please refer to the "product warranty card" section. For more information, please contact us directly.

## Packing directions

1. Please fill out the attached "Maintenance Information Card" in the back of the manual.
2. Do not transport the unit with any accessories, such as the wires, hardware and the manual. The product's repair does not need these items, and these items we are not responsible for.
3. When transporting the products, it must be fully protected. We recommend that you send back to repair with the original packaging.
4. If you transport the unit with your own packaging, the simple packaging at least meets the following requirements:

a. Use the double-layer carton which has passed the 275 PSI (PSI: pressure units, 1kg/cm2 approximately 14.5 PSI) burst test, and leave 8cm space to fill the solid foam polystyrene at the six surfaces.
b. Use enough sealing tape to seal the carton.
c. Do not use thin carton. The damage due to the poor packaging will not be able to enjoy the warranty.

## Non-warranty repair fee

As to the repair is not within the warranty range, we will confirm with you to agree the maintenance after we detecting and will start to repair after receiving the payment. If you do not agree to repair, please contact our service center ASAP to get back the amplifier. We have no obligation to keep your unit, if you do not get back your unit after 30 days, it will be became our property.
If you have any questions, please contact us.

## Warranty

Our company assures you whether you are the original purchaser or the subsequent owner of the product, within three (3) years purchased from the date you buying, no matter what the reason is for any non-human factors or the irresistible force effects caused the failure of the new products, our company will provide warranty.

**Warranty liability**

For any defect, no matter for any fault reason (except for the excluding objects), we will remedy by repair, replacement or refund. Unless you agree, or we can not provide the replacement service and can not solve the problem by repair or can not provide timely maintenance, or else we will not choose to refund. If we choose to refund, you must return the defective product or the product which can not work normally to us free of charge, and can not retain any lien or mortgage. The refund should be the same as the actual purchase price, not including the interest, insurance, poundage, and the reasonable depreciation from the date you purchase the product. The warranty work only can be carried out in the authorized service center or the factory. Our company will repair and send back the defective products within a reasonable time in the authorized repair center or the factory after receiving the product from the authorized repair center or the factory.

**How to get warranty service**

You must inform the local dealer about your warranty service needs within the warranty period,. All the components must be transported with the original packaging. Our authorized service center will take appropriate warranty measures within a reasonable time after receiving the defective product. If you do not satisfy with the repair results by our authorized service center, please notify our authorized service center immediately.

**Indirect or accidental damage disclaimer**

You have no right to obtain any damage compensation from us because of any defects of the new product of this series that cause the accident. Including such defect that causes any damage to other products.

**Warranty certificate modification**

Anyone has no right to extend, amend or modify this warranty. The warranty period will not be extended because you do not use the new products. The repair and replacement parts which are provided in this warranty terms only apply to the one which has not yet expired within the warranty period.

**Design alteration**

We reserve the right to alter any product design at any time without prior notice and will not bear the obligation to make the corresponding alteration to the products which product before.

**Buyer's legal remedies**

After the warranty expiring, the warranty is forced to terminate the implementation of any measures.

***This warranty statement will be in precedence to any other statements in this owner's manual.**

# WARRANTY CARD

The various series power amplifiers of our company are good products, each amplifier's delivery all will be through the stringent quality checks. Our company assures you that the products are in the good performance and devices are complete, and provide you free warranty service according to the this regulation.

- Meanwhile, when our company provides you warranty service, you must present the warranty card and the invoice as the proof condition. And we recommend that you consult with our service department before sending back the products to ensure the smooth service.
  Customer Service Hotline: 0086 -0757-87322796
  Within three-year warranty period since the date you purchase, if the product damages or has failure (except for not within the warranty range and the individual reasons mentioned below), and be confirmed by our technical department that the errors are not caused by non-operating, our company will provide free maintenance and replacement parts.
- In the following cases, our company will not give any maintenance and help:
  1. It is not the product which our company is as a agent.
  2. Fake (smuggled) goods;
  3. The product which has no body code, or the code has been altered, destroyed, converted and not in our company's sales records.
- In the following cases, the warranty card will automatically expire:
  1. The product has been burned because of the overload or the feedback and other reasons due to the mishandling;
  2. The product damage due to shipping failures;
  3. Due to the poor work environment (such as damp environment) which makes the products can not meet the requirements that cause damage;
  4. Due to the force majeure causes damage, such as natural disasters;
  5. The product has been repaired or modified by technician who is not our company's staff;
  6. The product has not been installed properly according to the operation guidance which causes damage.
- The warranty and service which is provided by our company is only limited to conduct in our service center and the product is sent back to repair by the customer. For the requirements of going out for warranty or maintenance, all the trip expenses are paid by you.
- Our company is not responsible for any losses which are caused by the damage of the product directly or indirectly.
- The product which exceeds the warranty period, our company will charge a reasonable service fee.
- Our company reserves the right to alter the terms without prior notice.

# SERVICE INFORMATION CARD

## Customer information

Name:_____ Phone No.:_____ Date : _____

Contact address: _____

Serial number: _____

## Maintenance records

| | | | | | | |
|---|---|---|---|---|---|---|
| Date | Fault | Processing condition | Inspection date | Mainte -nance order No. | Maintainer | Mainte -nance place |
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## Note